Section 3 –
Overall Trends Analyses for the Priority Chemicals (1999-2003)

Introduction

This section provides an overview of the national, EPA Region, State, and industry sector quantities (aggregated) of the 23 Priority Chemicals (PCs), for which data is reported to Toxics Release Inventory (TRI) for the 1999 through 2003 TRI reporting years. We focus on these five most current years of TRI data to facilitate the identification of viable, potential opportunities for reducing or eliminating PCs. The data presented in this section were derived using the 2008 GPRA methodology (see discussion in Appendix C) and focuses on trends for the PCs, as a whole. A discussion of the trends for individual PCs is presented in Section 4.

National Trends for the Priority Chemicals

Exhibits 3.1 and 3.2 show the total quantity of PCs from 1999 through 2003 as well as the number of facilities reporting these chemicals. In 2000 and, again in 2001, both the quantity and number of reporting facilities increased compared to 1999. The increases in 2000 were likely due to TRI reporting thresholds that were lowered for a number of the PCs in 2000 (see Exhibit 3.2) and also the initial reporting of three chemicals (benzo(g,h,i)perylene, dioxin/dioxin-like compounds, and pentachlorobenzene). Most of the increased quantity and number of facilities in 2001 likely can be attributed to the lowered TRI reporting threshold for lead and lead compounds. Since 2001, the total quantity of PCs has decreased and leveled to approximately 79 million pounds.

Exhibit 3.1. Total Quantity and Number of Facilities for the Priority Chemicals (1999-2003)

Reporting Year	1999	2000	2001	2002	2003
Total Quantity of Priority Chemicals (lbs)	77,252,326	99,642,648	84,015,526	79,250,350	79,232,695
Number of TRI Facilities Reporting Priority Chemical Quantity	1,540	2,438	5,560	5,448	5,332

Exhibit 3.2. Total quantity (lbs) and Number of Facilities reporting Priority Chemicals (1999 – 2003)

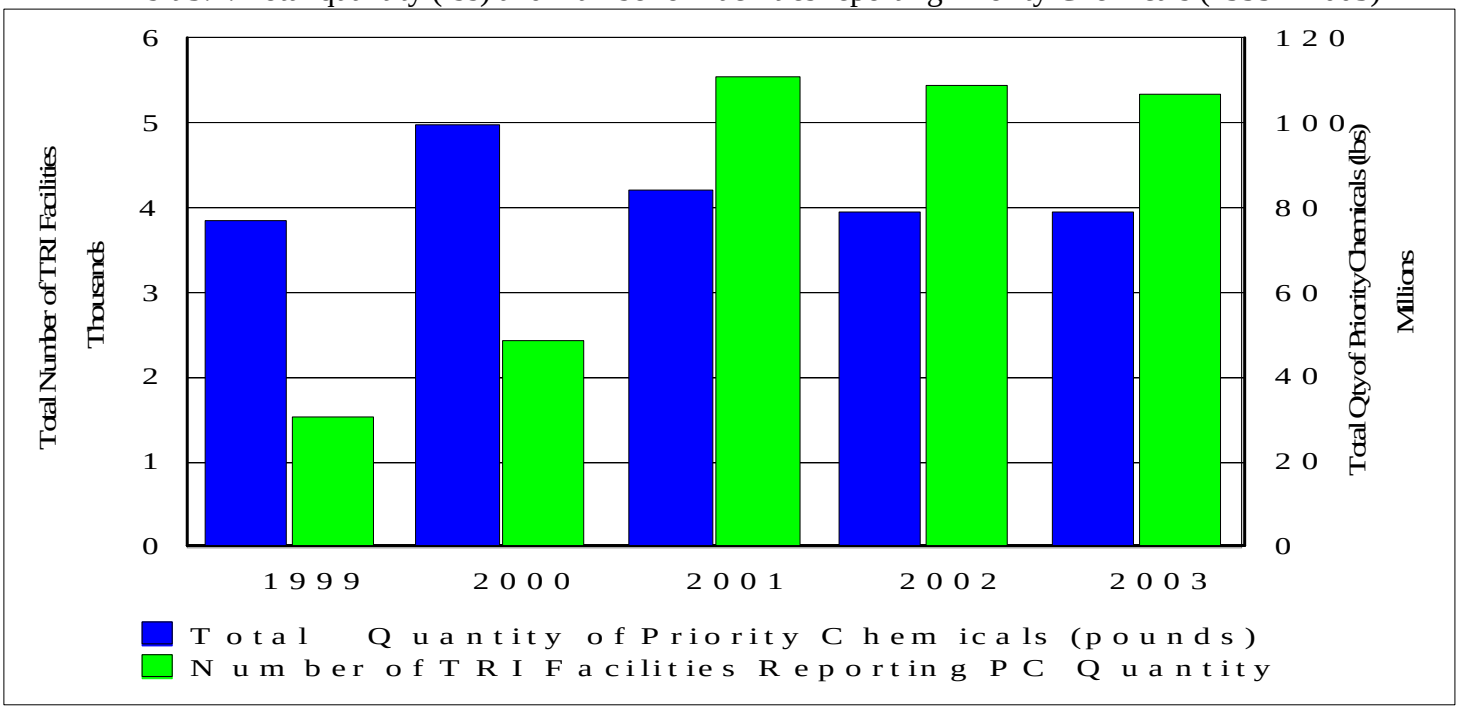

Exhibit 3.3 shows the total quantity of each PC reported in 1999-2003. In 2003, four PCs (lead and lead compounds, polycyclic aromatic compounds, naphthalene, and hexachloro-1,3-butadiene) comprised about 82 percent of the total national PC quantity. Lead and lead compounds consistently have accounted for the majority of the total national PC quantity -- comprise over 46 percent of the total quantity of the PCs in 2003. Nearly 13 million pounds of polycyclic aromatic compounds accounted for approximately 16 percent of the total national quantity of PCs in 2003.

Exhibit 3.3. Priority Chemicals - TRI Reporting Threshold Changes

Chemical Name	New Reporting Threshold	Year Change Became Effective
Benzo(g,h,i)perylene	10 pounds	2000
Dioxin and dioxin-like compounds category	0.1 grams	2000
Heptachlor	10 pounds	2000
Hexachlorobenzene	10 pounds	2000
Lead and Lead Compounds	100 pounds	2001
Mercury and Mercury Compounds	10 pounds	2000
Methoxychlor	100 pounds	2000
Pendimethalin	100 pounds	2000
Pentachlorobenzene	10 pounds	2000
Polycyclic Aromatic Compounds category	100 pounds	2000
Trifluralin	100 pounds	2000

Between 1999 and 2003, the total quantity of PCs increased by approximately 2.6 percent. Individual chemicals with increases included— polycyclic aromatic compounds, lead and lead compounds, phenanthrene, quintozene, 1,2,4 - trichlorobenzene, and pendimethalin. The quantities of three PCs (pentachlorobenzene, benzo(g,h,i)perylene, and dioxin/dioxin-like compounds), that have been reported to TRI since 2000, also increased. Again, as noted above, the increased quantity of some of the PCs in 2000, as well as lead and lead compounds in 2001, may be due, in part to the lowering of the respective TRI thresholds, likely resulting in additional facilities reporting to TRI and an increase in reported quantities.

Exhibit 3.4 shows the number of facilities that reported each of the PCs from 1999-2003. Please note that in this exhibit the total number of facilities, for any given year, differs from the total number of facilities shown in Exhibit 3.2 because numerous facilities reported more than one PC.

Exhibit 3.4. Total Quantity (lbs) of each Priority Chemical (1999 – 2003)

Chemical Name	1999	2000	2001	2002	2003	Percent of Total Quantity in 2003	Percent change (1999-2003)
Lead and Lead Compounds	32,854,376	37,420,838	36,996,580	34,907,262	36,667,276	46.3%	11.6%
Polycyclic Aromatic Compounds	8,354,179	16,569,173	14,115,733	12,771,563	12,672,606	16.0%	51.7%
Naphthalene	13,870,144	14,507,008	10,340,355	11,248,654	10,399,334	13.1%	-25.0%
Hexachloro-1,3-butadiene	8,764,908	11,297,081	6,404,741	5,167,385	5,566,299	7.0%	-36.5%
Hexachlorobenzene	5,401,706	5,934,773	5,765,862	4,208,878	4,272,727	5.4%	-20.9%
Hexachloroethane	3,625,369	5,709,981	4,145,249	4,056,497	2,734,341	3.5%	-24.6%
Phenanthrene	483,969	1,017,328	236,212	2,309,275	1,817,292	2.3%	275.5%
1,2,4 - Trichlorobenzene	1,388,599	1,189,077	2,182,996	1,527,029	1,674,271	2.1%	20.6%
Cadmium and Cadmium Compounds	1,103,788	1,488,696	932,493	749,570	817,579	1.0%	-25.9%
Quintozene	227,081	570,013	491,098	412,230	604,434	0.8%	166.2%
Pentachlorobenzene	0	239,852	487,719	311,156	484,733	0.6%	NA
Pendimethalin	219,791	674,131	200,195	421,827	429,551	0.5%	95.4%
Anthracene	453,254	546,297	360,830	345,482	419,068	0.5%	-7.5%
Benzo(g,h,i)perylene	0	2,104,398	988,675	308,362	315,294	0.4%	NA
Pentachlorophenol	212,995	69,790	54,339	36,856	160,760	0.2%	-24.5%
Dibenzofuran	118,826	92,802	66,720	288,912	75,605	0.1%	-36.4%
Trifluralin	87,820	88,485	93,489	63,555	57,290	0.1%	-34.8%
Mercury and Mercury Compounds	56,701	89,760	130,828	97,130	40,544	0.1%	-28.5%
2,4,5 - Trichlorophenol	26,098	32,443	20,657	17,913	22,857	0.0%	-12.4%
Dioxin and dioxin-like compounds	0	641	708	551	709	0.0%	NA
Lindane	2,722	64	46	183	71	0.0%	-97.4%
Heptachlor	0	0	0	79	54	0.0%	NA
Methoxychlor	0	17	1	1	0	0.0%	NA
TOTAL	**77,252,326**	**99,642,648**	**84,015,526**	**79,250,350**	**79,232,695**	**100.0%**	**2.6%**

Note: For some chemical quantities, a zero (0) was inserted for one or more of the following reasons: 1) Prior to 2000, benzo(g,h,i)perylene, dioxin and dioxin-like compounds, and Pentachlorobenzene were not reportable TRI quantities, 2) no quantity was reported to TRI, 3) based on our rounding-off process, quantities reported to TRI as <0.5 lbs are shown as zero quantity.

In 1999-2003, the PC quantity decreased for naphthalene, hexachoro-1,3-butadiene, hexachlorobenzene, and hexachloroethane. Exhibit 3.5 shows, for each of the PCs in 2003, the number of facilities that reported the PC within various quantity ranges. For most of the PCs, only a relatively small number of facilities accounted for the majority of the total quantity reported. For example, of the 4,572 facilities that reported a PC quantity of lead and lead compounds in 2003, only 5 facilities accounted for almost 30 percent of the total quantity and 71 facilities accounted for about 75 percent of the total quantity.

Exhibit 3.5. Number of Facilities That Reported Each Priority Chemical, by Quantity Range (2003)

Quantity Reported	Number of Facilities Reporting this quantity	Percent of Total Quantity for this Priority Chemical
1,2,4 - Trichlorobenzene (1,674,272 pounds)		
up to 10 pounds	2	less than 0.1%
Between 11 - 100 pounds	1	less than 0.1%
Between 101 -1,000 pounds	3	0.1%
Between 1,001 - 10,000 pounds	5	1.4%
Between 10,001 - 100,000 pounds	5	14.8%
Between 100,001 - 1 million pounds	1	6.1%
> 1 million pounds	1	77.7%
2,4,5 - Trichlorophenol (22,857 pounds)		
up to 10 pounds	0	0%
between 11 - 100 pounds	0	0%
between 101 -1,000 pounds	0	0%
between 1,001 - 10,000 pounds	0	0%
between 10,001 - 100,000 pounds	1	100.00%
between 100,001 - 1 million pounds	0	0%
> 1 million pounds	0	0%
Anthracene (419,068 pounds)		
up to 10 pounds	7	less than 0.1%
between 11 - 100 pounds	5	0.1%
between 101 -1,000 pounds	13	1.0%
between 1,001 - 10,000 pounds	7	8.9%
between 10,001 - 100,000 pounds	4	25.8%
between 100,001 - 1 million pounds	1	64.2%
> 1 million pounds	0	0.0%
Benzo(g,h,i)perylene (315,294 pounds)		
up to 10 pounds	218	0.1%
between 11 - 100 pounds	90	1.2%
between 101 -1,000 pounds	30	3.0%
between 1,001 - 10,000 pounds	17	17.8%
between 10,001 - 100,000 pounds	7	35.1%
between 100,001 - 1 million pounds	1	42.8%
> 1 million pounds	0	0.0%
Cadmium and Cadmium Compounds (817,579 pounds)		
up to 10 pounds	14	less than 0.1%
between 11 - 100 pounds	11	0.1%
between 101 -1,000 pounds	16	0.9%
between 1,001 - 10,000 pounds	15	9.1%
between 10,001 - 100,000 pounds	10	44.4%
between 100,001 - 1 million pounds	1	45.6%
> 1 million pounds	0	0.0%
Dibenzofuran (75,605 pounds)		
up to 10 pounds	1	less than 0.1%
between 11 - 100 pounds	0	0.0%
between 101 -1,000 pounds	5	2.1%
between 1,001 - 10,000 pounds	4	13.9%

between 10,001 - 100,000 pounds	2	84.0%
between 100,001 - 1 million pounds	0	0.0%
> 1 million pounds	0	0.0%
Dioxin and dioxin-like compounds (709 pounds)		
up to 10 pounds	360	12.0%
between 11 - 100 pounds	7	43.5%
between 101 -1,000 pounds	1	44.5%
between 1,001 - 10,000 pounds	0	0.0%
between 10,001 - 100,000 pounds	0	0.0%
between 100,001 - 1 million pounds	0	0.0%
> 1 million pounds	0	0.0%
Heptachlor (54 pounds)		
up to 10 pounds	0	0.0%
between 11 - 100 pounds	1	100.00%
between 101 -1,000 pounds	0	0.0%
between 1,001 - 10,000 pounds	0	0.0%
between 10,001 - 100,000 pounds	0	0.0%
between 100,001 - 1 million pounds	0	0.0%
> 1 million pounds	0	0.0%
Hexachloro-1,3-butadiene (5,566,299 pounds)		
up to 10 pounds	0	0.0%
between 11 - 100 pounds	0	0.0%
between 101 -1,000 pounds	1	0.1%
between 1,001 - 10,000 pounds	0	0.0%
between 10,001 - 100,000 pounds	1	1.1%
between 100,001 - 1 million pounds	1	7.6%
> 1 million pounds	2	91.2%
Hexachlorobenzene (4,272,727 pounds)		
up to 10 pounds	10	less than 0.1%
between 11 - 100 pounds	9	less than 0.1%
between 101 -1,000 pounds	4	less than 0.1%
between 1,001 - 10,000 pounds	9	0.8%
between 10,001 - 100,000 pounds	2	0.9%
between 100,001 - 1 million pounds	3	38.1%
> 1 million pounds	1	60.2%
Hexachloroethane (2,734,341 pounds)		
up to 10 pounds	0	0.0%
between 11 - 100 pounds	0	0.0%
between 101 -1,000 pounds	1	less than 0.1%
between 1,001 - 10,000 pounds	0	0.0%
between 10,001 - 100,000 pounds	4	6.3%
between 100,001 - 1 million pounds	4	33.7%
> 1 million pounds	1	60.0%
Lead and Lead Compounds (36,667,276 pounds)		
up to 10 pounds	1,573	less than 0.1%
between 11 - 100 pounds	1,041	0.1%
between 101 -1,000 pounds	1,085	1.1%
between 1,001 - 10,000 pounds	594	5.4%
between 10,001 - 100,000 pounds	208	18.3%

between 100,001 - 1 million pounds	66	45.2%
> 1 million pounds	5	29.9%
Lindane (71 pounds)		
up to 10 pounds	0	0.0%
between 11 - 100 pounds	1	100.0%
between 101 -1,000 pounds	0	0.0%
between 1,001 - 10,000 pounds	0	0.0%
between 10,001 - 100,000 pounds	0	0.0%
between 100,001 - 1 million pounds	0	0.0%
> 1 million pounds	0	0.0%
Mercury and Mercury Compounds (40,544 pounds)		
up to 10 pounds	320	2.1%
between 11 - 100 pounds	160	13.0%
between 101 -1,000 pounds	50	35.7%
between 1,001 - 10,000 pounds	10	49.1%
between 10,001 - 100,000 pounds	0	0.0%
between 100,001 - 1 million pounds	0	0.0%
> 1 million pounds	0	0.0%
Naphthalene (10,399,334 pounds)		
up to 10 pounds	40	less than 0.1%
between 11 - 100 pounds	51	less than 0.1%
between 101 -1,000 pounds	103	0.4%
between 1,001 - 10,000 pounds	127	4.8%
between 10,001 - 100,000 pounds	98	32.2%
between 100,001 - 1 million pounds	27	62.5%
> 1 million pounds	0	0.0%
Pendimethalin (429,551 pounds)		
up to 10 pounds	0	0.0%
between 11 - 100 pounds	0	0.0%
between 101 -1,000 pounds	0	0.0%
between 1,001 - 10,000 pounds	3	2.3%
between 10,001 - 100,000 pounds	4	32.5%
between 100,001 - 1 million pounds	1	65.2%
> 1 million pounds	0	0.0%
Pentachlorobenzene (484,733 pounds)		
up to 10 pounds	0	0.0%
between 11 - 100 pounds	1	less than 0.1%
between 101 -1,000 pounds	0	0.0%
between 1,001 - 10,000 pounds	1	0.7%
between 10,001 - 100,000 pounds	1	6.9%
between 100,001 - 1 million pounds	2	92.4%
> 1 million pounds	0	0.0%
Pentachlorophenol (160,760 pounds)		
up to 10 pounds	1	less than 0.1%
between 11 - 100 pounds	4	0.1%
between 101 -1,000 pounds	6	2.1%
between 1,001 - 10,000 pounds	7	14.8%
between 10,001 - 100,000 pounds	0	0.0%
between 100,001 - 1 million pounds	1	83.0%

> 1 million pounds	0	0.0%
Phenanthrene (1,817,292 pounds)		
up to 10 pounds	7	less than 0.1%
between 11 - 100 pounds	8	less than 0.1%
between 101 -1,000 pounds	14	0.5%
between 1,001 - 10,000 pounds	17	3.6%
between 10,001 - 100,000 pounds	3	4.1%
between 100,001 - 1 million pounds	3	91.8%
> 1 million pounds	0	0.0%
Polycyclic Aromatic Compounds (12,672,606 pounds)		
up to 10 pounds	215	less than 0.1%
between 11 - 100 pounds	167	0.1%
between 101 -1,000 pounds	137	0.4%
between 1,001 - 10,000 pounds	84	2.3%
between 10,001 - 100,000 pounds	37	10.2%
between 100,001 - 1 million pounds	14	33.7%
> 1 million pounds	6	53.3%
Quintozene (604,434 pounds)		
up to 10 pounds	0	0.0%
between 11 - 100 pounds	1	less than 0.1%
between 101 -1,000 pounds	1	0.1%
between 1,001 - 10,000 pounds	2	1.2%
between 10,001 - 100,000 pounds	0	0.0%
between 100,001 - 1 million pounds	2	98.7%
> 1 million pounds	0	0.0%
Trifluralin (57,290 pounds)		
up to 10 pounds	0	0.0%
between 11 - 100 pounds	2	0.2%
between 101 -1,000 pounds	4	2.8%
between 1,001 - 10,000 pounds	6	41.3%
between 10,001 - 100,000 pounds	1	55.7%
between 100,001 - 1 million pounds	0	0.0%
> 1 million pounds	0	0.0%

As previously discussed in Section 1, the total PC quantity is comprised of those quantities of the PCs that are managed onsite/offsite via disposal, treatment, and energy recovery. Exhibit 3.6 shows the national trends regarding the methods used to manage the PCs in 1999-2003. Disposal quantities, especially onsite disposal, have increased. Overall, the total energy recovery quantity has remained somewhat constant; with an increase of about 1.1 million pounds going to onsite energy recovery along with a corresponding decrease of the offsite energy recovery quantity. There has been a decrease of approximately 3.5 million pounds in the total treatment quantity – mostly offsite treatment. Recycling, both onsite and offsite, has decreased by about 25 percent, compared to the 1999 quantities. Nonetheless, it is apparent that a considerable percentage of the PCs has been and continues to be recycled. EPA hopes to increase recycling of the PCs, to the extent feasible, rather than have them be disposed, treated, or sent to energy recovery.

Exhibit 3.6. Trends in Management Methods for Priority Chemicals (1999-2003)

Management Method	Reporting Year				
	1999	2000	2001	2002	2003
Onsite Disposal	4,129,059	4,107,453	7,619,488	9,124,600	9,071,816
Offsite Disposal	29,937,003	33,226,387	30,436,117	27,961,944	30,589,106
Total Disposal	**34,066,063**	**37,333,840**	**38,055,605**	**37,086,543**	**39,660,922**
Onsite Energy Recovery	8,593,952	14,319,579	13,980,311	10,497,403	9,691,116
Offsite Energy Recovery	3,546,248	6,531,633	2,775,823	5,468,495	2,402,434
Total Energy Recovery	**12,140,200**	**20,851,212**	**16,756,134**	**15,965,898**	**12,093,550**
Onsite Treatment	26,395,997	35,655,905	26,727,256	24,761,134	26,028,974
Offsite Treatment	4,650,067	5,801,691	2,476,531	1,436,775	1,449,249
Total Treatment	**31,046,064**	**41,457,597**	**29,203,787**	**26,197,909**	**27,478,223**
Onsite Recycling	572,683,510	534,083,436	424,174,241	425,762,445	427,154,153
Offsite Recycling	276,392,151	255,700,460	249,330,474	281,847,907	213,044,100
Total Recycling	**849,075,661**	**789,783,897**	**673,504,715**	**707,610,352**	**640,198,253**

Exhibit 3.7 shows the trend (1999-2003) for recycling of the ten PCs with the largest quantities recycled in 2003. In terms of total quantity, lead and lead compounds dominate, with almost 615 million pounds recycled in 2003. However, since 1999, there has been a 25 percent drop in the recycling of lead and lead compounds. Aside from lead and lead compounds, there also have been significant decreases in recycling of PACs, anthracene, and mercury and mercury compounds. Since 1999, recycling increased for 6 of these PCs: naphthalene, cadmium and cadmium compounds, phenanthrene, hexachlorobenzene, hexachloroethane, and hexachoro-1,3-butadiene.

Exhibit 3.7. Recycling of Top Ten Priority Chemicals (1999-2003)

Chemical	1999	2000	2001	2002	2003	Percent Change 1999-2003	Percent Change 2001-2003
Lead and Lead Compounds	826,400,495	770,094,614	661,313,970	672,394,739	614,615,298	-25.6%	-7.1%
Naphthalene	13,437,824	12,231,088	6,310,310	25,677,936	18,495,107	37.6%	193.1%
Hexachloroethane	2,094,072	1,027,963	850,000	3,530,419	2,336,505	11.6%	174.9%
Polycyclic Aromatic Compounds	3,500,044	2,898,037	2,647,713	2,332,349	1,617,621	-53.8%	-38.9%
Cadmium and Cadmium Compounds	522,513	748,270	469,405	420,139	888,819	70.1%	89.4%
Phenanthrene	371,747	423,479	460,005	982,860	769,067	106.9%	67.2%
Mercury and Mercury Compounds	846,239	450,310	442,954	455,987	491,839	-41.9%	11.0%
Hexachlorobenzene	32,854	17,139	6,310	740,144	399,607	1116.3%	6232.9%
Hexachloro-1,3-butadiene	280,000	250,000	220,000	340,010	300,000	7.1%	36.4%
Anthracene	247,344	222,786	373,799	372,813	134,396	-45.7%	-64.0%